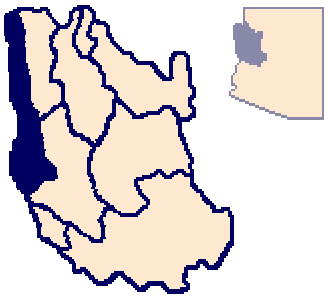
LAKE MOHAVE BASIN



The Lake Mohave basin covers approximately 1,050 square miles on a long narrow strip of northwestern Arizona (Figure 13). The area is in the Basin and Range province. The basin is bounded by the Black Mountains to the east and the Colorado River to the west which also forms the Arizona-California state line. Elevations within the basin range from about 500 feet above mean sea level at the southernmost boundary to over 5,000 feet above mean sea level in the Black Mountains. Because of the arid conditions, the only surface water in the basin other than the Colorado River comes from a series of thermal springs located between 0.5 and five miles downstream of Hoover Dam (Bentley, 1979). The exact source of the springs is unknown.

The principal water-bearing formations in the basin are the alluvial sand, silt and gravel deposits adjacent to Lake Mohave and the Colorado River. Historical data indicated a general gradient to the west from recharge areas near the mountains (Bentley, 1979a), and to the east along the river (Metzger and Loeltz, 1973) prior to filling of Lake Mohave. During filling of the lake, water moved outward from the lake into the adjacent permeable formations establishing a new base elevation. Today, as with pre-dam years, recharge to the surrounding formations from surface water occurs when the lake stage is rising, and discharge to the lake occurs when the lake stage is falling. The regional groundwater level is higher than it was prior to filling of the lake, however, regional groundwater movement is still westward from the mountain front toward the lake (Bentley, 1979b). No significant underflow from Davis Dam occurs because of a granite ridge which extends across the river and basin (Bentley, 1979b). Groundwater recharged from the lake is prevented from migrating south by this ridge. In localized areas along stream courses or mountain fronts, groundwater may occur above the regional aquifer but, in general, these sources are small (Bentley, 1979b). Depth to bedrock reaches 8,000 feet beneath the Colorado River in the basin south of Lake Mohave and over 400 feet near the lake (Oppenheimer and Sumner, 1980). In general, groundwater is unconfined and, near the lake, all alluvial deposits are hydraulically connected (Bentley, 1979b and Metzger and Loeltz, 1973).

Groundwater in storage has been estimated to be 1.2 million acre-feet (Arizona Department of Water Resources, 1988). Well yields reaching 1,000 gallons per minute can be achieved in the vicinity of the Colorado River and Lake Mohave (Bentley, 1979b). Yields and the aquifer's saturated thickness generally decrease with increasing distance from the lake. Recharge to the alluvial sediments adjacent to the river comes mainly from the infiltration of surface water supplies. Use of this water requires contracts with the U.S. Bureau of Reclamation. The amount of recharge from surface water is controlled by the surface water elevation and the amount of surrounding groundwater pumpage; recharge generally increases with groundwater pumpage (Metzger and Loeltz, 1973). Mountain front recharge is considered negligible (Owen-Joyce, 1987).

Water from the sediments adjacent to the lake is similar in chemical characteristics to the lake water which contains high dissolved solids, arsenic, and sulfate levels (Bentley, 1979b). Water recharged in the mountains or along mountain fronts differs in chemical composition from that derived from the lake, but also contains high dissolved solids and fluoride concentrations. Dissolved solids levels here range from about 330 to 2,700 milligrams per liter (Bentley, 1979b). Also found in isolated locations across the basin are high concentrations of fluoride, iron, sulfate, and chloride (Bentley, 1979a and 1979b; Metzger and Loeltz, 1973). The Bullhead City area has significant nitrate contamination of groundwater associated with septic tanks (Arizona Department of Environmental Quality, 1990).